

Patent Claims:

1. An electro-chemical method of direct nano-structured material deposition on a substrate by precipitating at least one material
5 component from a pressure and temperature controlled atmosphere with at least one precursor gas containing a precursor compound under the influence of a locally narrowly limited electric field built up as a function of voltage and time between the movable electrically conducting tip of a probe of a touchless scanning microscope and the
10 substrate, the precursor compound breaking down above a predetermined voltage threshold value and the separated material component being deposited on the substrate in the region of the tip of the probe,
characterized by
15 the simultaneous or sequential use of a plurality of precursor gases (PG) each with a different precursor compound (DMCd, DETe) containing a different material component (Cd, Te) in a gas mixture of adjustable mixing ratio and by the material components (Cd, Te) separated from the broken down different precursor compounds
20 (DMCd, DETe) reacting into a common chemical compound (CdTe) in accordance with the selected mixing ratio and locally deposited on the substrate (S).
2. The electro-chemical method of claim 1,
25 characterized by the fact that elements of the chemical groups V and/or VI (Te) are used as material components which react with other material components from chemical groups I, II, (Cd), III and/or IV to a compound semiconductor (CdTe) as a common chemical compound.
3. The electro-chemical method of claim 2,
30 characterized by the fact that

a chalco-pyrite from the material system (Cu, Ag)(Ga, In, Al)(O, S, Se)₂ is formed as a compound semiconductor.

4. The electro-chemical method of one of claims 1 to 3,
5 characterized by the fact that
the use of the precursor gas (PG) and/or their mixing ratio in the gas
mixture is chronologically varied during a precipitation process.
- 10 5. The electro-chemical method of one of claims 1 to 4,
characterized by the fact that
all variations of parameters are determined and controlled by a
computer in dependence of the precipitated common chemical
compound (CdTe).
- 15 6. The electro-chemical method of one of claims 1 to 5,
characterized by the fact that
a flexible substrate (S) is used.
- 20 7. Semiconductor component made by the electro-chemical method
according to one of claims 1 to 6,
characterized by
a structure as a light absorbing photo diode (PD) or as a light
emitting diode or as an array of either.
- 25 8. The semiconductor component of claim 7,
characterized by
a structure as an array (SPA) the photo (PD) and/or light emitting
diodes of which are of different spectral absorption or emission.
- 30 9. The semiconductor component of claim 8,
characterized by
a structure as an array (SPA) of uniformly repeating structure of a

plurality of photo (PD) and/or light emitting diodes of different spectral absorption or emission.

10. The semiconductor component of one of claims 7 to 9,
characterized by
an insulating oxide layer (IS) between individual photo (PD) and/or light
emitting diodes and a semiconductive cover layer of a charge
conductivity opposite that of the photo (PD) and/or light emitting
diodes.

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